



## Creating a chance to SHINE everyday

### Science Policy

This policy was ratified: July 2018

And will be reviewed: July 2021

Signed by Headteacher: Samantha Welsby

Signed by Chair: Dave McWhirter

Signed by Subject Lead Governor: Alex Balzaretti

#### **1. INTRODUCTION**

1.1 Science is a core subject within the National Curriculum. It is intended that this policy should describe the purpose, nature and leadership of science at Newbold and Tredington C of E Primary School and that it should give some indication of the importance that the school places on excellent teaching and learning in this curriculum area.

#### **2. RATIONALE**

2.1 We believe that Science learning at Newbold and Tredington C of E Primary School should:

- Be relevant to our children;
- Promote curiosity;
- Encourage our children to be 'risk-takers';
- Develop our children as 'What if...?' question makers;
- Involve teaching where exploration is facilitated;
- Allow our children to talk about ideas yet have high expectations that they make links to support their ideas;
- Create an ethos of shared engagement where ideas are debated;
- Allow opportunities for science to continue after the lesson has finished, through parental engagement and further challenge;
- Promote problem-solving skills;
- Encourage forward thinking alongside reflection and evaluation.

#### **3. AIMS**

3.1 The Governing Body and staff of Newbold and Tredington C of E Primary School are committed to providing an excellent science education for all its children. Across the whole curriculum we aim to:

- Create a happy, caring and secure environment promoting an ethos which reflects the school's commitment to high achievement, good relationships and the equality of opportunity for all children.
- Offer a broad, balanced and relevant curriculum, providing challenging programmes of study that enable pupils of all abilities to achieve their full potential.
- Promote high standards of morals, values and behaviour. We will encourage all children to work hard, to take responsibility for their actions and co-operate with and respect others as well as themselves.

3.2 In Science, we aim to encourage children to work scientifically i.e. through observation, recording, measurement and experimental control. We wish to develop their specialist scientific vocabulary through speaking and listening, learning from each other. We feel it is important to demonstrate the social and economic implications of science, all within a cross-curricula approach to learning.

3.3 Specifically, in the Key Stage 1 science curriculum, we aim to provide opportunities for pupils to:

- Observe, explore and ask questions about living things, materials and phenomena.

- Begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas.
  - Evaluate evidence and consider whether comparisons or tests are fair.
  - Use reference materials to find out more about scientific ideas.
  - Share their ideas and communicate them using scientific language, drawings, charts and tables.
- 3.4 Furthermore, in the Key Stage 2 Science curriculum, we aim to provide opportunities for pupils to:
- Learn about a wider range of living things, materials and phenomena.
  - Begin to make links between ideas and to explain things using simple models and theories.
  - Apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health.
  - Begin to think about the positive and negative effects of scientific and technological developments on the environment.
  - Carry out more systematic investigations, working on their own and with others.
  - Use a range of sources in their work.
  - Talk about their work and communicate ideas using a wide range of scientific language, conventional diagrams, charts and graphs.

#### **4. INCLUSION**

4.1 The National Curriculum Inclusion Statement reminds us that all teachers are required to follow these inclusive principles:

1. Setting suitable learning challenges, enabling all children to experience success and achieve as high a standard as possible through appropriate differentiation;
2. Creating an effective learning environment;
4. Securing their motivation and concentration;
5. Providing equality of opportunity through teaching approaches;
6. Using appropriate assessment approaches;
7. Setting targets for learning.
8. Overcoming potential barriers to learning and assessment for individuals and groups of pupils.

4.2 Newbold and Tredington C of E Primary School fully supports the above inclusion principles in our key policies.

#### **5. LEGAL REQUIREMENTS**

5.1 Science is a National Curriculum core subject. Schools are required to teach all core and non-core subjects in order to provide a broad and balanced curriculum. In science children are required to study topics across four areas:

Scientific Enquiry  
 Life Processes and Living Things  
 Materials and their Properties  
 Physical Processes

5.2 The time allocation for teaching science is approximately 1 hour per week in Key Stage 1 and 2 hours per week in Key Stage 2.

5.3 Children in the Foundation Stage are required to follow the areas of learning as set out in the early learning goals. They will experience science through any of the seven areas of learning.

5.4 The curriculum at Newbold and Tredington C of E Primary School is organised to include the Programmes of Study as set out in the National Curriculum. We value the importance of science in its own right. We also recognise that it provides great opportunities for children to develop skills and knowledge in other curriculum areas. For this reason children study science both as a discrete subject and within cross-curricular contexts when appropriate.

5.5 The school uses a skills based curriculum in order to maintain continuity and breadth in the subject, and to ensure links with other curriculum areas as required.

#### **6. TEACHING AND LEARNING STRATEGIES**

6.1 The current long term plan for science at Newbold and Tredington C of E Primary School ensures progress through and coverage of all areas of the National Curriculum.

6.2 Scientific enquiry will be taught through contexts taken from the working scientifically skills. With regard to scientific enquiry skills, it has been agreed that Key Stage One staff will plan for a whole investigation to be carried out each term, whereas Key Stage Two staff will plan for a whole investigation per half term. A complete investigation consists of the following elements:

1. Question – what the children are trying to find out e.g. Does the thickness of wire in a circuit affect the brightness of the bulb?

2. Prediction – what they think will happen (in KS2 the children must consider and explain why they think this will happen)

3. Method – how they will carry out their test (aspects of fair testing - altering one variable only - must be discussed in KS1 and planned for in KS2)

4. Equipment – what they will need for their test

5. Results and analysis – observations, numerical measurements, graphs or charts

6. Conclusion – an evaluation of what their results tell them. Children must be taught to make generalisations about what their evidence tells them (an 'er' statement that links the independent variable (what you changed) to the dependent variable (what you measured) e.g. the thicker the wire, the brighter the bulb).

7. Comments can also be made on what happened, what they might change next time and for what reasons.

6.3 Weekly planning for working scientifically could be a relatively small exercise or could be the major focus of a lesson. Examples are: writing a conclusion when given a table of results only, asking children to 'tell the story' when presented with only a graph, constructing graphs from tables of results for experiments they have not carried out or writing a plan for an exciting test that they would not normally be able to do in school.

6.4 It is important that the difference between reliability/accuracy and fair testing is made clear. Repeating a test only makes the results more accurate; it does not ensure a fair test. Only varying one factor at a time will make a test fair.

6.5 Effective planning will ensure that pupils' learning is based on their present knowledge and understanding of concepts. Much of the pupils' learning will be developed from first hand experiences. Pupils should be offered opportunities to learn both independently and in collaboration, as group or class activities lead to a wider exchange and comparison of ideas, which are particularly helpful for younger pupils.

6.6 In order for children to learn successfully there should be a clear progression of concepts and knowledge. The school long term plan for science has been designed with this in mind. It is important to note the following:

- Science vocabulary should be used precisely and taught in both Key Stages.
- Tables should be introduced by the end of Year 1, with Year 3 onwards drawing their own tables for recording results.
- Arrows should be introduced for forces by the end of Year 2.

## **7. RECORD KEEPING AND ASSESSMENT**

7.1 Assessing children's progress in science is an ongoing process that takes place as a result of carefully planned learning outcomes.

7.2 The work the children complete serves as a record. It is not necessary to make detailed records in relation to these outcomes. However, strengths and areas for development may be noted by the teacher. This will help the teacher to be aware of who needs more help, who is ready for extension work, who is making better or worse progress than expected and whether all pupils, including those with PLP's, are meeting their learning targets.

7.3 Reports are sent home during the academic year. These reports will contain a comment on pupil's progress in science.

## **8. ORGANISATION**

8.1 In both Key Stages the children's learning progresses systematically from Year 1 to Year 6; the teaching sequence is indicated on the long term plan for science.

8.2 This scheme of work for science at Newbold and Tredington C of E covers all the requirements from the National Curriculum.

8.3 Children in both Key Stages and the Foundation Stage will experience science each week, with the appropriate amount of time given to science learning, as stated in the Legal Requirements section of this policy document.

## **9. EQUAL OPPORTUNITIES**

9.1 At Newbold and Tredington C of E Primary School, we strive to ensure that the culture and ethos of the school are such that, whatever the heritage and origins of members of the school community, everyone is valued and treat one another with respect. Pupils should be provided with the opportunity to experience, understand and celebrate diversity.

## **10. SPECIAL EDUCATIONAL NEEDS**

10.1 At Newbold and Tredington C of E Primary School, we believe that all children should be given opportunities to participate in and have their achievements and experiences in science recognised and celebrated. Such participation requires a variety of teaching and learning styles, open ended assignments and differentiated learning experiences. It is the responsibility of the class teacher to provide appropriate access for any children with special educational needs.

## **11. REVIEW, EVALUATION AND MONITORING**

11.1 It is the responsibility of the science leader to monitor standards in science, evaluate progression and highlight areas to be targeted for improvement. To achieve all this the post holder will:

- Assess progression by monitoring coverage and attainment of skills
- Carry out regular work trawls of Science books, focusing on one or more elements of the requirements for medium term planning.
- Observe teaching and learning of Science in KS1 and KS2.
- Lead training in Science through INSET or staff meetings as appropriate.

11.2 Feedback from these actions will be given to the Head of Federation, staff and governors, as appropriate.

## **12. REVIEW, EVALUATION AND MONITORING**

12.1 Where possible children should be encouraged to select appropriate resources for their work. All Science resources will be stored in dedicated areas. Other than general equipment, such as thermometers and stopwatches, resources are stored in topic boxes, which are clearly labelled with an inventory included. General equipment is kept in trays.

12.2 Visits will be organised as and when they are appropriate to the area of study. These may include trips to farms, zoos, parks, and museums. The pond and the school grounds are also useful for studying habitats, minibeasts and plants.

## **13. HEALTH AND SAFETY**

13.1 Throughout the teaching of Science safety aspects will always be stressed. Pupils will be taught from an early age to be aware of potential dangers and to be aware of out will not endanger the pupils and that appropriate precautions are taken.

## **14. CROSS-CURRICULAR LINKS**

14.1 Science will sometimes be taught as a discrete subject. However some learning lends itself to cross-curricular links. This will often be Literacy, Numeracy or ICT but can include History, Geography, Art and Design Technology.

## **15. USE OF ICT**

15.1 Areas in which ICT can be used in science teaching and learning include:

- Use of multimedia programs to present findings and make comparisons.
- Use of sensors to detect sound, light and temperature changes.
- Use of DVDs, websites or iPad apps to see things that cannot be directly observed.
- Use of branching databases to develop use of sorting keys.
- Collecting data to compile a class database.
- Using a variety of apps, including stop-motion and time-lapse.

## **16. STAFF DEVELOPMENT**

16.1 It is the responsibility of the Head Teacher and science leader to be aware of the training needs of individual members of staff where science is concerned and where priorities and finances permit, suitable courses will be offered. It will be appropriate, at times, to use staff meetings or INSET days to develop teaching and learning in science.

## **APPENDIX 1: SCIENCE ACROSS THE CURRICULUM- LONG TERM PLAN**

The following table details how the science knowledge and understanding from the National Curriculum for key stage 1 and 2 are to be covered in years 1 to 6 through the use of a 2 year rolling programme.

	<u>Autumn term</u>	<u>Spring term</u>	<u>Summer term</u>
<u>R/year 1 - Cycle 1</u> <u>2017 / 2018</u>	<u>Animals including humans</u>	<u>Living things and their habitats</u>	<u>Plants</u>
<u>R/year 1 - Cycle 2</u> <u>2018 / 2019</u>	<u>Seasonal changes</u>	<u>Everyday materials</u>	<u>Animals including humans</u>
<u>Year 2/3 - Cycle 1</u> <u>2017 / 2018</u>	<u>Materials and uses</u> <u>How things move</u>	<u>Food chains/habitats</u> <u>Living/Non living</u>	<u>Forces and magnets</u>
<u>Year 2/3 - Cycle 2</u> <u>2018 / 2019</u>	<u>Rocks</u> <u>Fossils</u>	<u>Plants lifecycle</u> <u>Animals - skeletons/ nutrition</u>	<u>Light/shadows</u> <u>Forces/magnets</u>
<u>Year 4/5 - Cycle 1</u> <u>2017 / 2018</u>	<u>States of matter</u> <u>Animals including humans</u>	<u>Living things and their habitats</u>	<u>Sound</u> <u>Electricity</u>
<u>Year 4/5 - Cycle 2</u> <u>2018 / 2019</u>	<u>Animals including humans</u>	<u>Properties and change of materials</u>	<u>Living things and their habitats</u>
<u>Year 6- Cycle 1 and 2</u> <u>2017 / 2018</u> <u>2018 / 2019</u>	<u>Light</u> <u>Electricity</u>	<u>Living things and their habitats</u> <u>Animals including humans</u>	<u>Evolution and inheritance</u>